

### REMARKS

By the present Amendment, claims 1-15 are cancelled and claims 16-32 are added to clarify the claims. This leaves claims 16-32 pending in the application, with claims 16, 20, 29 and 31 being independent.

#### Claim Objections

The newly submitted claims are not in multiple dependent form, thereby obviating the objection under 37 C.F.R. § 1.75(c).

#### Substitute Specification

The specification is revised to eliminate grammatical and idiomatic errors in the originally presented specification, and to add an Abstract of the disclosure. The number and nature of the changes made in the specification would render it difficult to consider the case and to arrange the papers for printing or copying. Thus, the substitute specification will facilitate process of the application. The substitute specification includes no "new matter". Pursuant to M.P.E.P. § 608.01(q), voluntarily filed, substitute specifications under these circumstances should normally be accepted. A marked-up copy of the original specification is appended hereto.

The reference number "4a" is in the upper right hand portion of Fig. 2 of the originally filed drawings.

#### Rejections Under 35 U.S.C. § 112, Second Paragraph

The original claims stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. The terminology alleged to be vague and indefinite is modified. The recitation "soft, hard and glass" solder is believed to refer to known types of solder. Thus, the presently pending claims are definite and comply with 35 U.S.C. § 112.

#### Claim Rejections Under 35 U.S.C. § 102 and § 103

Claim 16 covers a preformed, generally cylindrical outer cover 3 having an axis of rotation 2, a jacket surface and a front surface. Electrically conductive reversal segments 4 are fastened on the outer cover, have segmental surfaces resting on the jacket surface and have first and second opposite ends. Bent, planar positioning means 309 and 311 extend from opposite ends of the segmental surfaces 308. A stud 310 extends from one segment and to provide a coil winding connection. Corresponding recesses are on the outer cover front surface to receive the positioning members.

By forming the commutator in this manner, the positioning means and the corresponding recesses interact for positioning and orienting the segments on the cover. Such interaction facilitates manufacture and provides a secure and accurate connection.

Original claims 1-6 stand rejected under 35 U.S.C. § 102 as being anticipated by U.S. Patent No. 2,486,875 to Pollock. The Pollock patent is cited for a commutator with a generally cylindrical outer cover 6, commutator segments 3 fastened to the outer surface by a bonding agent and interactive means with recesses 8, 10 and 12 in the segments interfitting with complimentary projections on the outer cover positioning and orienting the segments on the

cover. The sheets of insulating material 5 placed between the segments and the outer cover and impregnated with heat convertible or polymerized resin insulation is alleged to provide a bonding agent between the segments and outer cover. The Pollock anchors are interpreted as including complimentary projections and recesses with the segments being inserted radially.

Claims 1, 5, 7 and 10-13 stand rejected as being unpatentable over International Application No. WO 95/14319 in view of U.S. Patent No. 3,819,967 to Binder. The International application is cited for a commutator with a preformed generally cylindrical outer cover 16, commutator segments 10 fastened onto the cover and anchoring recesses 318 in the cover and complementary projections 314 on the segments. The Binder patent is cited for allegedly teaching an adhesive layer applied to the base member to connect commutating segments 18 with a layer comprising an epoxy. In support of the rejection, it is contended that it would be obvious to use the Binder adhesive in the International application commutator.

Claims 1 and 8 stand rejected under 35 U.S.C. § 103 as being unpatentable over European Patent No. 0 127 801 to Gobrecht in view of European Patent No. 0 361 860 to Stobl. The Gobrecht patent is cited for a commutator with a preformed, generally cylindrical ceramic cover 1 and commutator segments 2 fastened on the cover by a soldered, aluminum oxide bonding layer 3. The Stobl patent is cited for a commutator with a cylindrical base or a cover 1 and a plurality of commutator segments glued thereto and having tongue 6 inserted into complimentary recesses 7 in the base. In support of the rejection, it is contended that it would be obvious to provide the Stobl interactive means or tongues of the Gobrecht commutator.

The Pollock patent discloses a commutator having a metallic shell 6 cast into the spaces between the segments (column 2, lines 46-47). Since shell 6 is cast in place, it is not preformed

into a cylindrical shape as recited in claim 16. Additionally, the commutator segments 3 have recesses 8, 10 or 12 which engage complementary projections on the retainer member shell, which complementary projections extend only along the outer or jacket surface of the Pollock shell. In this manner, the Pollock commutator segments 3 do not have bent, planar positioning members extending from their opposite ends or corresponding recesses on the front surface of the shell to receive such positioning members. Moreover, the Pollock patent does not disclose a stud extending from the end to connect to a coil winding. Thus, the Pollock patent is further distinguished by the claimed positioning members, stud and corresponding members which find no corresponding structure in the Pollock patent.

While the cited International application (WO 95/14319) discloses a number of different arrangements for securing segments to an outer cover, all such segments are only attached to the jacket surface of the outer cover and not to its front surface. Specifically, none of the International application segments have bent, planar positioning members extending from their opposite ends. Also, such segments do not have corresponding recesses on the outer cover front surface to receive those positioning members. Since the Binder patent applied in a combination with this International application also does not have the claimed positioning members and corresponding recesses, the Binder patent does not cure the deficiencies in the International application. Accordingly, claim 16 is patentably distinguishable over the International application and the Binder patent, considered individually or in any obvious combination thereof, by the claimed positioning members and corresponding members.

The European Gobrecht patent comprises segments 2 secured by a binding layer 3 to an outer cover 1. However, the segments 2 do not have bent planar positioning members extending

from their opposite ends; and the front surface of the cover does not have corresponding members to receive the positioning members. These deficiencies in the Gobrecht patent are not cured by the European Stobl patent application applied in combination with the Gobrecht patent. The Stobl patent application, as noted in the International Preliminary Examination Report, has only one bent planar end section 11 at one of its ends, but such does not engage a recess on the front side of the outer cover. While the member 6 at the other end is received in a recess, such member is not planar as required in claim 16.

Accordingly, claim 16 is patentably distinguishable over the cited patents.

Claim 17-19, being dependent upon claim 16, are also allowable for the above reasons. Moreover, these dependent claims recite additional features further distinguishing them over the cited patents. Specifically, the lugs of claim 17, the bonding layer of claim 18, and the adhesive layer of claim 19 are not anticipated or rendered obvious by the cited patents, particularly within the overall claimed combination.

Claim 20 covers a commutator, for example, as illustrated in Figs. 3 and 5, comprising a preformed generally cylindrical outer cover 103 having an axis of rotation 102 and a core. A cup-shaped connector 103' has a frontal member with a keyhole-shaped recess 106 and is mounted on the outer cover. Electrically conductive current reversal segments 104 are fastened on the connector with the connector mounted between the segments and the outer cover by a bonding agent. A projection 107 on the core corresponds to and is received in the recess to fasten the connector to the core by a clamping action.

By forming the commutator in this manner, the commutator can have a secure connection of the segments and connector on the outer cover, while being simple and inexpensive to manufacture. Such arrangements are particularly affective for the planar commutator.

Clearly, none of the five patents cited and applied in the rejection of the originally filed claims disclose the claimed cup-shaped connector, segments fastened on the connector with the connector clamped to the outer cover by the mating engagement of a keyhole-shaped recess on the connector and a mating projection on the cover core. Accordingly, claim 20 is patentably distinguishable over the cited patents.

Claims 20-28, being dependent upon claim 22, are also allowable for the above reasons. Moreover, these dependent claims recite additional features further distinguishing them over the cited patents. Specifically, the dependent claims are further distinguished by the insulating bonding layer of claim 21, the electrically conductive bonding layer of claim 22, the bonding layers of claims 23, the segmental disks fastened on the frontal member of the connector of claim 24, the soldered layer of claims 25 and 26, and the welded layer of claims 27 and 28, particularly within the overall claimed combination.


Claims 29 and 31 are directed to the process for manufacturing the commutator of claims 16 and 20, respectively. Accordingly, these claims are patentably distinguished over the cited patents for the same reasons advanced above in connection with those claims. Such reasons are not repeated to avoid burdening the record.

Claims 30 and 32, being dependent upon claims 29 and 31, respectively, are also allowable for the above reasons. Moreover, these claims are further distinguished by the step of

all of the segments being delivered simultaneously to the outer cover, particularly within the overall claimed combinations.

In view of the foregoing, claims 16-32 are allowable. Prompt and favorable action is solicited.

Respectfully submitted,

  
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